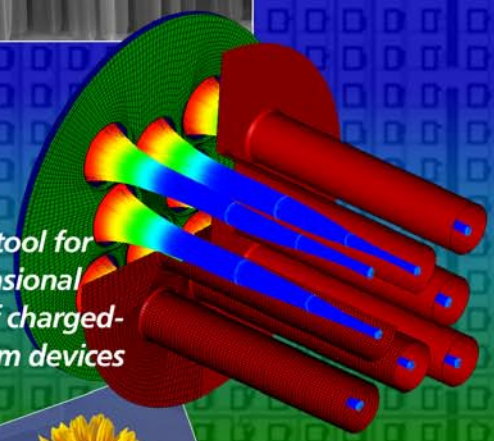
R&D 100
2007 Call for Submissions

ENABLE:
Energetic Neutral Atom Beam Lithography/Epitaxy

We're proud to have won five 2006 R&D 100 Awards. These teams demonstrate the innovation and creativity of the Los Alamos staff and their ability to translate abstract concepts into real-world technology.

Los Alamos National Laboratory has hundreds of technologies available for licensing and many areas of capabilities in which we can partner with industry.



MICHELLE:
A software tool for three-dimensional modeling of charged-particle-beam devices

Green Primaries:
Enviro-friendly energetic materials

PixelVizion:
An NPU-embedded visualization accelerator for large data sets

(Background) Trident:
A high-level language compiler

Los Alamos
NATIONAL LABORATORY
EST. 1943

Los Alamos National Laboratory

2007 Call for Submissions

The teams receiving 2006 R&D 100 awards reflect the world-class science and technology conducted at Los Alamos. I am proud of these award recipients and all of our teams who submitted entries. Their dedication, creativity, ingenuity, and effective collaboration exemplify our Laboratory. I am proud to be a part of an organization brimming with so much talent.

—Dr. Michael Anastasio, Laboratory Director

We take special pride each year in working with staff members to prepare excellent submission packages for our finest technologies. The awards bring distinction to both the teams and the Laboratory. I urge you to consider participating in this year's competition.

—Duncan McBranch, Technology Transfer Division Leader

What is the R&D 100 Competition?

Since 1963, R&D Magazine has conducted an annual competition to select the 100 most innovative products, materials, processes, software, and systems of the previous year for its prestigious R&D 100 Awards. Winning innovations are selected on the basis of their technical importance and usefulness. Judges for the competition include a panel of 50 outside technical experts and the editors of *R&D Magazine*.

An international competition, the R&D 100 Award is regarded as a benchmark for excellence by both industry and government. The Laboratory's winning record over the last 28 years is impressive. Los Alamos technologies have won 103 awards since the Laboratory entered the competition in 1978. While the Laboratory is extremely proud of its winners, it is proud of all participants who qualify to compete. The Laboratory Director annually hosts a recognition reception at the Bradbury Science Museum to honor all participants. Winning teams attend *R&D Magazine's* Awards Banquet held in October at Chicago's Navy Pier Conference Center.

Why should I enter my technology?

Entering the competition is an excellent way to increase staff and program recognition for a technology and an inventor. DOE has publicly commended the R&D 100 winners from its laboratories for their innovative research. Winners are eligible to receive up to $25K in funding from the Technology Transfer (TT) Division to market technologies with demonstrated commercial potential.

What can I enter?

Any new product, process, material, software, or system that has shown demonstrable technological significance compared with competing products during the 2006 calendar year is eligible for the 2007 competition. Previously submitted technologies that can claim a significant advance or partnership development in 2006 may qualify for **resubmission**. "Proof of concept" models are viewed skeptically by the judges and should not be entered until they are developed to a more advanced stage.

Participation Schedule:

- ***Kickoff Meetings***
  September 19, 2006
  2:00 p.m.
  TT Pecos Room
- ***September 21, 2006***
  2:00 p.m.
  TT Pecos Room
- ***Interview forms accepted until October 6, 2006***
- ***R&D review committee interviews and selection, September and October 2006***
- ***Develop entry October–February***
- ***Entry submittal to*** **R&D Magazine**
  March 1, 2007
- ***Director-Hosted Recognition Reception for all submitting teams, Bradbury Science Museum***
  May 2007
- ***Announcement of Winners***
  July 3, 2007
- **R&D Magazine**
  Awards Ceremony
  Chicago
  October 2007

Who can help me with the submission process?

TT Division coordinates the Laboratory's participation in the competition. *R&D Magazine* and its readers are especially interested in the market or societal impact of the innovative technologies submitted. TT can help potential participants determine a fair market value as well as the intellectual property status of a proposed technology.

Editors and designers on the Communication Arts & Services (CAS) R&D 100 production team work with entrants to build compelling arguments for the importance and usefulness of their innovations and to create striking supporting graphics. All Los Alamos entries have a common format, coordinated by the Laboratory's R&D 100 production team. The team prepares entries to reach Chicago by the March 2007 deadline.

For information about entry development, contact TT Coordinator Kim Sherwood, 665-1305, ksherwood@lanl.gov.

How does the Laboratory benefit?

Participation in the R&D 100 competition is a perfect opportunity for us to showcase the Laboratory's contributions to U.S. industrial competitiveness. R&D 100 Award winners enhance the Laboratory's image as a leader in technological innovation and help create new opportunities to build our intellectual property portfolios. These portfolios enable us to share our resources with society and create new opportunities to transfer our knowledge through licenses and spinoff technologies and to enhance our research base. All participants have an opportunity to work with TT staff to advance commercial development of their technologies.

Since the mid 1990s, winning innovations have returned more than $40 million in funding to Los Alamos in the form of cooperative research and development agreements (CRADAs), Work for Others, User Facility Agreements and licenses. More than 100 patent awards have been associated with R&D 100 winners and many more patents are pending. Twenty-five percent of the Laboratory's commercial licenses can be attributed to R&D 100 winners, while 45 percent of noncommercial licenses are associated with winners.

How do I enter?

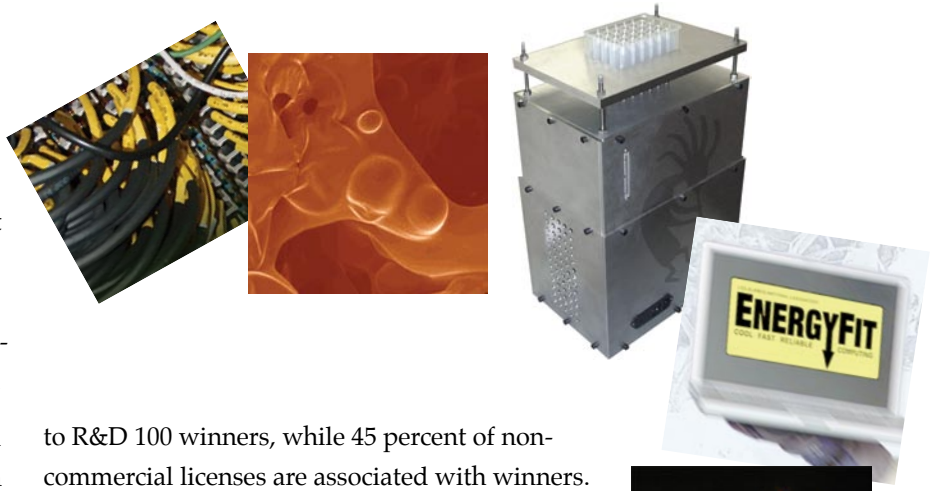
Potential participants should follow these steps:

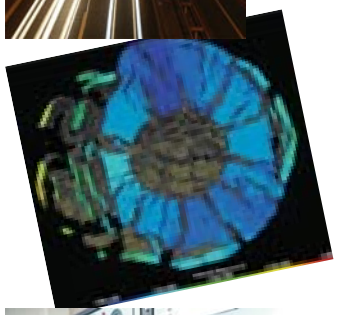
1. Attend one of the two **kickoff meetings** that will be held in September (see sidebar opposite page). These one-hour meetings will cover the nature of the award, this year's schedule, and entry requirements. Later, individuals or teams must interview with the R&D 100 review committee to determine appropriateness of a technology for the competition and to discuss eligibility requirements and the best way to present innovations in terms of the judging criteria.

If you are familiar with the R&D 100 process or cannot attend a kickoff meeting, skip to step 2.

2. Decide to pursue entry in the 2007 competition.
3. Fill out the R&D 100 electronic pre-interview form found at: www.lanl.gov/orgs/tt/docs/rd100/form07.doc. Fax, mail, or e-mail your entry form before interview and no later than October 6, 2006, to Kim Sherwood at 665-3125, MS C333, or ksherwood@lanl.gov.
4. Contact Kim Sherwood at 665-1305 or ksherwood@lanl.gov to set up an interview with the R&D 100 review committee.
5. PIs complete draft submission by the end of November, then work with the CAS R&D 100 production team to develop their final submissions from December to February 2007.

Contact Kim Sherwood at 665-1305, or ksherwood@lanl.gov for general questions about the competition.





Graphics from 2006 submissions

Contact information:

CAS Team Coordinator
Octavio Ramos
665-3897
orj@lanl.gov

TT R&D 100 Awards Program Manager
Kim Sherwood
665-1305
ksherwood@lanl.gov

Los Alamos National Laboratory R&D 100 Award Winners

1978–2006

1978
- Diamond Machining of Optics
- Electronic Identification System
- Electronic Device for Treating Tumors—Hyper Thermic Cancer Treatment

1980
- Wee Pocket Radiation Detector
- Portable Multichannel Analyzer

1981
- Radio Frequency Quadrapole Linac

1982
- WC Field Computer System

1983
- Transuranic Waste Assay System

1984
- Superconducting Magnetic Energy System

1985
- BHTP—A Unique Scintillation Compound

1986
- Aurora Laser Beam Alignment System

1988
- Optical Microrobot Single-Cell Manipulator/Analysis System
- Nuclear Material Solution Assay System
- 32-Stepper Motor Position Controller
- Mobile Beryllium Monitor
- HTMS Reference Electrode
- Oriented, Highly Anisotropic Conducting Polymer
- Photoinjector for RF Linac Accelerators
- Lattice Gas Algorithm

1989
- Fourier Transform Flow Cytometer
- Noncontact Superconductor Screening
- Conductive Lattices

1990
- Coolahoop
- Universal Process for Fingerprint Detection
- Fast Agarose Gel Electrophoresis
- Solid-State NO_2 Sensor
- Upconversion Solid-State Laser
- A Broadband (ABB) Mw Absorption Spectrometer for Liquid Media
- MdS_2/SC Composites

1991
- Semi-Insulator Detector
- Optical High-Acidity Detector
- Resonant Ultrasonic Inspection
- Single Molecule Detector

1992
- Thermal Neutron Multiplicity Counter
- Plastic Laser Dye Rods
- Cryogenic Diamond Turning
- Portable Laser Spark Surface Mass Analyzer
- Zeeman Refractive Index Detector
- Animated Display of Inferred Tongue, Lip, and Jaw Movements During Speech

1993
- Selenium-Based Reagents for the Evaluation of Chiral Molecules
- Phase-Sensitive Flow Cytometry
- Ultrafast Infrared Spectrometer
- Mini Elastic Backscatter Lidar

1994
- Ultrasensitive Ultrasonic Transducer
- Telemetric Heat Stress Monitor
- Optical Biopsy System
- Lattice Boltzmann Permeameter
- Directed Light Fabrication of Complex Metal Parts
- Bartas Iris Identification

1995
- The Indigo-830
- ARS Chemical Fill Detector
- Hydride-Dehydride Recycle Process
- HIPPI-SONET Gateway
- Microsensor for VOCs
- Polymer Filtration System

1996
- TRACER (Transportable Remote Analyzer for Characterization & Environmental Remediation)
- PLASMAX (Plasma Mechanical Cleaner for Silicon Wafers)

1997
- Falcon: Breakthrough Software for Simulating Oil Reservoirs
- Rapid Size Analysis of Individual DNA Fragments
- ASR Detect—Diagnostic Method for Analyzing Degrading Concrete
- Dry Wash
- Plasma Source Ion Implantation for Enhancing Materials Surfaces
- High Performance Storage

1998
- Cyrax™—Portable, 3-D Laser-Mapping and Imaging System
- Low-Smoke Pyrotechnics
- SOLVE—Creating 3-D Pictures of Protein Molecules from X-Ray Diffraction Spots
- Underground Radio

1999
- Acoustic Stirling Heat Engine
- Atmospheric Pressure Plasma Jet
- CHEMIN: A Miniaturized X-Ray Diffraction and X-Ray Fluorescence Instrument
- PREDICT—A New Approach to Process Development
- Real-Time, Puncture-Detecting, Self-Healing Materials
- REED-MD: A Computer Code for Predicting Dopant Density Profiles in Semiconductor Materials
- The Sulfur Resistant Oxymitter 4000™

2000
- ANDE: Advanced Nondestructive Evaluation System
- Electroexploded Metal Nanoparticles

2001
- Free-Space Quantum Cryptography
- SCORR—Supercritical CO_2 Resist Remover
- Tandem-Configured Solid-State Optical Limiter

2002
- GENIE: Evolving Feature-Extraction Algorithms for Image Analysis
- HDF5 – Hierarchical Data Format

2003
- CARISS: Integrated Elemental and Compositional Analysis
- BASIS: High-Confidence Biothreat Detection and Characterization
- FIRETEC: A Physics-Based Wildfire Model
- Flexible Superconducting Tape
- FlashCT™
- Green Destiny
- PowerFactoRE: A Suite of Reliability Engineering Tools for Optimizing the Manufacturing Process
- Super-Thermite Electric Matches

2004
- Clustermatic: A Complete Cluster Management Software Solution
- Confocal X-Ray Fluorescence Microscope
- mpiBLAST: A High-Speed Software Catalyst for Genetic Research
- Plasma-Torch Production of Spherical Boron Nitride Particles
- 10-Gigabit Ethernet Adapter: Speed Really Changes Everything

2005
- CartaBlanca: A High-Efficiency, Object-Oriented, General-Purpose Computer Simulation Environment
- MESA: Measuring Enzyme-Substrate Affinities
- nanoFOAM: A Metal-Nanofoam Fabrication Technique
- NESSUS-V8: A Probablistic Engineering Analysis Software

2006
- ENABLE: Energetic Neutral Atom Beam Lithography/Epitaxy
- Green Primaries: Enviro-Friendly Energetic Materials
- MICHELLE: A Software Tool for Three-Dimensional Modeling of Charged-Particle-Beam Devices
- PixelVizion: An NPU-Embedded Visualization Accelerator for Large Data Sets
- Trident